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but perhaps true branching occurs in some species closely related to this organism. Motile masses are never produced by the Ascomycetes, a difference that constitutes a valid point of separation. Meyer discusses the relationship of Schizomycetes to this group, and proposes the following classification of the

BACTERIACEÆ.

BACTERIEÆ. Cells motionless. *Bacterium.*
BACILLEÆ. Flagella arising from the whole surface. *Bacillus.*
PSEUDOMONATEÆ. Flagella polar.
    (*a*) Normally with a single flagellum. *Bactrineum.*
    (*b*) Normally with more than one flagellum. *Bactrilleum.*
ASTASIEÆ. Flagella in groups, lateral.
    Flagella in one or two groups, one-celled rods. *Astasia.*

L. H. PAMMEL.

Brown Rot of Cruciferous Plants. — Erwin F. Smith, who has made an exhaustive and careful study,[1] concludes that *Pseudomonas campestris* is responsible for the brown rot of cabbage and other cruciferous plants. There certainly seems to be no doubt that the organism described somewhat briefly by the writer several years ago is identical with that described by Smith. It produces a distinct browning in the bundles, the bacteria having a fondness for the alkaline sap of the bundles and little attraction for the acid parenchyma. Infections were obtained by needle punctures, by means of slugs and insect larvæ, and through the water pores situated on the teeth of the leaves. Infections through ordinary stomata were not obtained; the waxy bloom on the cabbage leaf protects the plant. It is probable that a majority of the natural infections in the field take place above ground, the disease being transmitted from diseased to healthy plants and from one part of a plant to another, as the result of the visits of insects and other small animals. The organism grows well in feebly alkaline beef broth. Gelatin is slowly liquefied. In addition to these media, Smith cultivated it on cabbage broth, litmus cabbage broth, agar, potato, carrot, beet, onion slices, orange segments, cocoanut flesh, etc. In cruciferous substrata it grew promptly and with great vigor, except on the horse-radish, where the growth at first was slow. On steamed cauliflower the organism was brightest, approximately lemon yellow or light cadmium; it was dullest on the steamed turnip, where there was also a marked production of the brown pigment. The organism was also grown in fermentation tubes using the various kinds of sugars. It is not an acid or gas producer. A brief summary of characters is given at the end of the paper. The organism is closely related to Wakker's *Bacterium hyacinthi*, from which it differs chiefly in its pathogenic properties. This paper is an important contribution to our knowledge of bacterial diseases of plants. Great care was observed in details of making media, and the manner in which the infection experiments were conducted should be highly commended.

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[1] Erwin F. Smith, Pseudomonas campestris (Pammel): The Cause of a Brown Rot in Cruciferous Plants. *Centralb. f. Bakt. u. Parasitenk.*, Abt. ii, Bd. iii, pp. 284–291, 408–415, 478–486, Pl. VI. 1897.

In a second paper on the same subject[1] Dr. Smith deals largely with methods of prevention, giving the result of field studies made in 1897. Nine-tenths of the infections are through water pores. Infections by means of the gnawings of insects were also observed. The disease has been successfully inoculated into the black mustard, and is common in some places on charlock. No evidence has been obtained to show that it is transmitted by seed. A contaminated soil is the most frequent source of infection. The observations here recorded leave little room to doubt that the organism lives over winter in the soil, that it is often transplanted from contaminated soil to healthy fields in diseased seedlings, and that the preparation of healthy seed beds, *i.e.*, on soil free from this organism, is one of the most important preventive measures. Of course, rotation of crops would also be an effective remedy.

L. H. PAMMEL.

A New Laboratory Manual.—To the many laboratory manuals is added a new one in the field of botany,[2] which is intended to give the student a general view of the subject and at the same time to lay a foundation upon which more advanced studies may be built. The author suggests that the rather extended scope of the book need not prevent its use for briefer courses, since by judicious selection certain parts only may be used where the entire field cannot be covered. One hundred and ninety-one illustrations add to the attractiveness of the book, and in the main they are well selected from good sources. Though the illustration of a laboratory guide is a device for conveying information rather than promoting independent investigation, it is by no means certain that it is a reprehensible practice when, as is

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[1] The Black Rot of the Cabbage. *Farmers' Bulletin*, No. 68. U. S. Dep. of Agric., Washington, D. C., Jan. 8, 1898.

[2] C. H. Clark, *A Laboratory Manual in Practical Botany*. New York, American Book Company (1898), 271 pp.